

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A radio cell station apparatus to which a plurality of personal stations can establish space division multiple access, comprising:
 - a transmitting and receiving unit for transmitting to and receiving from each of the personal stations a signal including a reference signal, which is a signal train consisting of a plurality of bits, and used for a synchronization process of a reception signal from each of the personal stations;
 - a reference signal defining unit for defining one or more reference signals optimized for each multiplexed connection number of the personal stations establishing said space division multiple access to said radio cell station apparatus;
 - ~~one or more reference signals, each being a signal train consisting of a plurality of bits included in a communication signal, defined in said radio cell station apparatus and optimized for each multiplexed connection number of the personal stations establishing said space division multiple access to said radio cell station apparatus, said radio cell station comprising:~~
 - a multiplexed connection number detection unit for detecting a number of multiplexed connections of the personal stations establishing space division multiple access during communication; and
 - a reference signal allocation unit for:
 - switching the reference signals that have been allocated to the personal stations establishing space division multiple access respectively prior to a change in the number of multiplexed connections to reference signals for maintaining communication quality even after the number of multiplexed connections is changed, and
 - allocating the switched reference signals to said plurality of personal stations respectively, when the change in the number of multiplexed connections is detected during communication in said multiplexed connection number detection unit.

2. (Previously Presented) The radio cell station apparatus according to claim 1, further comprising a storage unit for storing a reference signal optimized for each number of multiplexed connections of the personal stations establishing space division multiple access, wherein

when the number of multiplexed connections of the personal stations establishing space division multiple access is changed, said reference signal allocation unit selects reference signals optimal for the changed number of multiplexed connections from said storage unit and allocates the selected reference signals to said plurality of personal stations respectively.

3. (Previously Presented) The radio cell station apparatus according to claim 2, wherein

said reference signal stored in said storage unit is calculated for each number of multiplexed connections based on a high autocorrelation characteristic and a low cross-correlation characteristic.

4. (Currently Amended) A personal station establishing space division multiple access to a radio cell station apparatus, comprising:

a transmitting and receiving unit for transmitting to and receiving from said radio cell station apparatus a signal including a reference signal, which is a signal train consisting of a plurality of bits, used for a synchronization process of a reception signal from each of said personal stations, defined in said radio cell station apparatus and optimized for each multiplexed connection number of the personal stations establishing said space division multiple access to said radio cell station apparatus;

~~one or more reference signals, each being a signal train consisting of a plurality of bits included in a communication signal, defined in said radio cell station apparatus and optimized for each multiplexed connection number of the personal station establishing said space division multiple access to said radio cell station apparatus said radio cell station comprising:~~

a receiving unit for receiving a request for switching a reference signal from said radio cell station apparatus in accordance with a change in the number of multiplexed

connections of the personal stations establishing space division multiple access during communication; and

a switching unit for switching the reference signal to a reference signal for maintaining communication quality even after the number of multiplexed connections is changed and transmitting a response to the request for switching to said radio cell station apparatus.

5. (Previously Presented) The personal station according to claim 4, further comprising a storage unit for storing a reference signal optimized for each number of multiplexed connections of the personal stations establishing space division multiple access, wherein

when the request for switching the reference signal is received from said radio cell station apparatus, a reference signal optimal for the changed number of multiplexed connections is selected from said storage unit and a response to the request for switching including the selected reference signal is transmitted to said radio cell station apparatus.

6. (Previously Presented) The personal station according to claim 5, wherein

said reference signal stored in said storage unit is calculated for each number of multiplexed connections based on a high autocorrelation characteristic and a low cross-correlation characteristic.

7. (Currently Amended) A method of controlling a reference signal performed by a radio cell station apparatus to which a plurality of personal stations can establish space division multiple access, comprising the steps of:

transmitting to and receiving from each of the personal stations a communication signal including a reference signal, which is a signal train consisting of a plurality of bits, and used for a synchronization process of a reception signal from each of the personal stations;

defining one or more reference signals optimized for each multiplexed connection number of the personal stations establishing said space division multiple access to said radio cell station apparatus;

~~one or more reference signals, each being a signal train consisting of a plurality of bits included in a communication signal, defined in said radio cell station apparatus and optimized for each multiplexed connection number of the personal stations establishing said space division multiple access to said radio cell station apparatus, said method comprising the steps of:~~

detecting a number of multiplexed connections of the personal stations establishing space division multiple access during communication; and

when a change in the number of multiplexed connections is detected in said step of detecting the number of multiplexed connections, switching the reference signals that have been allocated to the personal stations establishing space division multiple access respectively prior to change in the number of multiplexed connections to reference signals for maintaining communication quality even after the number of multiplexed connections is changed, and allocating the reference signals to said plurality of personal stations respectively.

8. (Original) The method of controlling a reference signal according to claim 7, further comprising the step of storing a reference signal optimized for each number of multiplexed connections of the personal stations establishing space division multiple access, wherein

when the number of multiplexed connections of the personal stations establishing space division multiple access is changed, reference signals optimal for the changed number of multiplexed connections that have been stored are selected and the selected reference signals are allocated to said plurality of personal stations respectively.

9. (Original) The method of controlling a reference signal according to claim 8, wherein

the step of storing a reference signal optimized for each number of multiplexed connections of the personal stations establishing space division multiple access further

includes the step of calculating a reference signal for each number of multiplexed connections based on a high autocorrelation characteristic and a low cross-correlation characteristic.

10. (Currently Amended) A method of controlling a reference signal performed by a personal station establishing space division multiple access to a radio cell station apparatus, comprising the steps of:

transmitting to and receiving from said radio cell station apparatus a communication signal including a reference signal, which is a signal train consisting of a plurality of bits, used for a synchronization process of a reception signal from each of said personal stations, defined in said radio cell station apparatus and optimized for each multiplexed connection number of the personal stations establishing said space division multiple access to said radio cell station apparatus;

~~one or more reference signals, each being a signal train consisting of a plurality of bits included in a communication signal, defined in said radio cell station apparatus and optimized for each multiplexed connection number of the personal station establishing said space division multiple access to said radio cell station apparatus, said radio method comprising the steps of:~~

receiving a request for switching a reference signal from said radio cell station apparatus in accordance with change in the number of multiplexed connections of the personal stations establishing space division multiple access during communication; and

switching the reference signal to a reference signal for maintaining communication quality even after the number of multiplexed connections is changed and transmitting a response to the request for switching to said radio cell station apparatus.

11. (Original) The method of controlling a reference signal according to claim 10, further comprising the step of storing a reference signal optimized for each number of multiplexed connections of the personal stations establishing space division multiple access, wherein

when the request for switching the reference signal is received from said radio cell station apparatus, a reference signal optimal for the changed number of multiplexed

connections that has been stored is selected and a response to the request for switching including the selected reference signal is transmitted to said radio cell station apparatus.

12. (Original) The method of controlling a reference signal according to claim 11, wherein

the step of storing a reference signal optimized for each number of multiplexed connections of the personal stations establishing space division multiple access further includes the step of calculating a reference signal for each number of multiplexed connections based on a high autocorrelation characteristic and a low cross-correlation characteristic.

13. (Currently Amended) A computer program embodied in a computer readable medium, for controlling a reference signal performed by a radio cell station apparatus to which a plurality of personal stations can establish space division multiple access, causing a computer to execute the steps of:

transmitting to and receiving from each of the personal stations a communication signal including a reference signal, which is a signal train consisting of a plurality of bits, and used for a synchronization process of a reception signal from each of the personal stations;

defining one or more reference signals optimized for each multiplexed connection number of the personal stations establishing said space division multiple access to said radio cell station apparatus;

~~one or more reference signals, each being a signal train consisting of a plurality of bits included in a communication signal, defined in said radio cell station apparatus and optimized for each multiplexed connection number of the personal stations establishing said space division multiple access to said radio cell station apparatus, causing a computer to execute the steps of:~~

~~detecting a number of multiplexed connections of the personal stations establishing space division multiple access during communication; and~~

~~when a change in the number of multiplexed connections is detected in said step of detecting the number of multiplexed connections, switching the reference signals that have been allocated to the personal stations establishing space division multiple access~~

respectively prior to change in the number of multiplexed connections to reference signals for maintaining communication quality even after the number of multiplexed connections is changed, and

allocating the reference signals to said plurality of personal stations respectively.

14. (Previously Presented) The computer program embodied in a computer readable medium, for controlling a reference signal according to claim 13, further causing the computer to execute the step of storing a reference signal optimized for each number of multiplexed connections of the personal stations establishing space division multiple access, wherein

when the number of multiplexed connections of the personal stations establishing space division multiple access is changed, reference signals optimal for the changed number of multiplexed connections that have been stored are selected and the selected reference signals are allocated to said plurality of personal stations respectively.

15. (Previously Presented) The computer program embodied in a computer readable medium, for controlling a reference signal according to claim 14, wherein the step of storing a reference signal optimized for each number of multiplexed connections of the personal stations establishing space division multiple access further causes the computer to execute the step of calculating a reference signal for each number of multiplexed connections based on a high autocorrelation characteristic and a low cross-correlation characteristic.

16. (Currently Amended) A computer program embodied in a computer readable medium, for controlling a reference signal performed by a personal station establishing space division multiple access to a radio cell station apparatus, causing a computer to execute the steps of:

transmitting to and receiving from said radio cell station apparatus a communication signal including a reference signal, which is a signal train consisting of a plurality of bits, used for a synchronization process of a reception signal from each of said

personal stations, defined in said radio cell station apparatus and optimized for each multiplexed connection number of the personal stations establishing said space division multiple access to said radio cell station apparatus;

~~one or more reference signals, each being a signal train consisting of a plurality of bits included in a communication signal, defined in said radio cell station apparatus and optimized for each multiplexed connection number of the personal stations establishing said space division multiple access to said radio cell station apparatus, causing a computer to execute the steps of:~~

receiving a request for switching a reference signal from said radio cell station apparatus in accordance with change in the number of multiplexed connections of the personal stations establishing space division multiple access during communication; and

switching the reference signal to a reference signal for maintaining communication quality even after the number of multiplexed connections is changed and transmitting a response to the request for switching to said radio cell station apparatus.

17. (Previously Presented) The computer program embodied in a computer readable medium, for controlling a reference signal according to claim 16, further causing the computer to execute the step of storing a reference signal optimized for each number of multiplexed connections of the personal stations establishing space division multiple access, wherein

when the request for switching the reference signal is received from said radio cell station apparatus, a reference signal optimal for the changed number of multiplexed connections that has been stored is selected and a response to the request for switching including the selected reference signal is transmitted to said radio cell station apparatus.

18. (Previously Presented) The computer program embodied in a computer readable medium, for controlling a reference signal according to claim 17, wherein the step of storing a reference signal optimized for each number of multiplexed connections of the personal stations establishing space division multiple access further causes the computer to execute the step of calculating a reference signal for each number of

multiplexed connections based on a high autocorrelation characteristic and a low cross-correlation characteristic.

19. (Previously Presented) The radio cell station apparatus according to claim 1, wherein

an optimal reference signal pattern for each multiplexed connection number is defined on condition that each signal for said personal station establishing space division multiple access can be separated and extracted in a stable manner.

20. (Previously Presented) The personal station according to claim 4, wherein

an optimal reference signal pattern for each multiplexed connection number is defined on condition that each signal for said personal station establishing space division multiple access can be separated and extracted in a stable manner.

21. (Previously Presented) The method of controlling a reference signal according to claim 7, wherein

an optimal reference signal pattern for each multiplexed connection number is defined on condition that each signal for said personal station establishing space division multiple access can be separated and extracted in a stable manner.

22. (Previously Presented) The method of controlling a reference signal according to claim 10, wherein

an optimal reference signal pattern for each multiplexed connection number is defined on condition that each signal for said personal station establishing space division multiple access can be separated and extracted in a stable manner.

23. (Previously Presented) The computer program, embodied in a computer readable medium, for controlling a reference signal according to claim 13, wherein

an optimal reference signal pattern for each multiplexed connection number is defined on condition that each signal for said personal station establishing space division multiple access can be separated and extracted in a stable manner.

24. (Previously Presented) The computer program, embodied in a computer readable medium, for controlling a reference signal according to claim 16, wherein an optimal reference signal pattern for each multiplexed connection number is defined on condition that each signal for said personal station establishing space division multiple access can be separated and extracted in a stable manner.